

Fourth Grade New Math Core Compared to the Old Math Core
DRAFT 9.10.07

Common to Both (Based on New Language)	New Core Only	Old Core Only
<p>Standard I: Students will acquire number sense and perform operations with whole number, simple fractions, and decimals.</p> <p>Objective 1: Demonstrate multiple ways to represent whole numbers and decimals, from hundredths to one million, and fractions.</p> <ul style="list-style-type: none"> • Read and write numbers in standard and expanded form. • Demonstrate multiple ways to represent whole numbers and decimals by using models and symbolic representations (e.g., 36 is the same as the square of six, three dozen, or 9×4). • Identify the place and the value of a given digit in a six-digit numeral, including decimals to hundredths. • Divide regions, lengths, and sets of objects into equal parts using a variety of models and illustrations. • Name and write a fraction to represent a portion of a unit whole, length, or set for halves, thirds, fourths, fifths, sixths, eighths, and tenths. • Identify and represent square numbers using models and symbols. 	<ul style="list-style-type: none"> • Round to the nearest tenth. <p>Extensions:</p> <ul style="list-style-type: none"> • Whole numbers to one million. • Decimals to hundredths. • Representation of square numbers using symbols. 	
<p>Objective 2: Analyze relationships among whole numbers, commonly used fractions, and decimals to hundredths.</p> <ul style="list-style-type: none"> • Compare the relative size of numbers (e.g., 475 is comparable to 500; 475 is small compared to 10,000 but large compared to 98). • Order whole numbers up to six digits, simple fractions, and decimals using a variety of methods (e.g., number line, fraction pieces) and use the symbols $<$, $>$, and $=$ to record the relationships. • Identify a number that is between two given numbers (e.g., 3.2 is between 3 and 4; find a number between 0.1 and 0.2). 	<ul style="list-style-type: none"> • Identify equivalences between fractions and decimals by connecting models to symbols. • Generate equivalent fractions and simplify fractions using models, pictures, and symbols. 	<ul style="list-style-type: none"> • Identify the number that is 100 more, 100 less, 1,000 more, or 1,000 less than any whole number up to 10,000.

<p>Objective 3: Model and illustrate meanings of multiplication and division of whole numbers and the addition and subtraction of fractions.</p> <ul style="list-style-type: none"> Model multiplication (e.g., equal-sized groups, rectangular arrays, area models, equal intervals on the number line), place value, and properties of operations to represent multiplication of a one- and two-digit factor by a two-digit factor and connect the representation to an algorithm. Demonstrate the mathematical relationship between multiplication and division (e.g., $3 \times \square = 12$ is the same as $12 \div 3 = \square$ and $\square = 4$) and use the relationship to explain that division by zero is not possible. Represent division of a three-digit dividend by a one-digit divisor, including whole number remainders, using a variety of methods (e.g., rectangular arrays, manipulatives, pictures), and connect the representation to an algorithm. 	<ul style="list-style-type: none"> Use rectangular arrays to interpret factoring (e.g., find all rectangular arrays of 36 tiles and relate the dimensions of the arrays to factors of 36). Use models to add and subtract simple fractions where one single-digit denominator is 1, 2, or 3 times the other (e.g., $2/4 + 1/4$; $3/4 = 1/8$). <p>Extensions:</p> <ul style="list-style-type: none"> Division of a three-digit dividend. 	<ul style="list-style-type: none"> Recognize that division by zero is not possible. Describe the effect of place value when multiplying whole numbers by 10 and 100.
<p>Objective 4: Solve problems involving multiplication and division of whole numbers and addition and subtraction of simple fractions and decimals.</p> <ul style="list-style-type: none"> Use estimation, mental math, paper and pencil, and calculators to perform mathematical calculations and identify when to use each one appropriately. Select appropriate methods to solve a single operation problem and estimate computational results or calculate them directly, depending on the context and numbers involved in a problem. Write a story problem that relates to a given multiplication or division equation, and select and write a number sentence to solve a problem related to the environment. 	<ul style="list-style-type: none"> Solve problems involving simple fractions and interpret the meaning of the solution (e.g., A pie has been divided into six pieces and one piece is already gone. How much of the whole pie is there when Mary comes in? If Mary takes two pieces, how much of the whole pie has she taken? How much of the pie is left?) 	
<p>Objective 5: Compute problems involving multiplication and division of whole numbers and addition and subtraction of simple fractions and decimals.</p> <ul style="list-style-type: none"> Multiply up to a three-digit factor by a two-digit factor with fluency, using efficient procedures. Divide up to a three-digit dividend by a one-digit divisor with fluency, using efficient procedures. 	<ul style="list-style-type: none"> Demonstrate quick recall of basic multiplication and division facts. Add and subtract decimals and simple fractions where one single-digit denominator is 1, 2, or 3 times the other (e.g., $2/4 + 1/4 = 3/4$; $1/3 = 1/6 = 1/6$). <p>Extensions</p> <ul style="list-style-type: none"> Divide up to a three-digit dividend... 	

<p>Standard II: Students will use patterns and relations to represent mathematical problems and number relationships.</p> <p>Objective 1: Identify, analyze, and determine rules for describing numerical patterns involving operations and nonnumerical growing patterns.</p> <ul style="list-style-type: none"> Analyze growing patterns using objects, pictures, numbers, and tables <i>to determine a rule for the pattern.</i> Recognize, represent, and extend simple patterns involving multiples and other number patterns (e.g., square numbers) using objects, pictures, numbers, and tables. 	<ul style="list-style-type: none"> Analyze...to determine a rule for the pattern. Identify simple relationships in real-life contexts and use mathematical operations to describe the pattern (e.g., the number of legs on a given number of chairs may be determined by counting by fours or by multiplying the number of chairs by 4). 	<ul style="list-style-type: none"> Repeating patterns.
<p>Objective 2: Use algebraic expressions, symbols, and properties of the operations to represent, simplify, and solve mathematical equations and inequalities.</p> <ul style="list-style-type: none"> <i>Use the order of operations</i> to evaluate, simplify, and compare mathematical expressions involving the four operations, parentheses, and the symbols $<$, $>$, and $=$ (e.g., $2x(4 - 1) + 3$; of the two quantities $7 - (3 - 2)$ or $(7 - 3) - 2$, which is greater?). Recognize that a symbol represents the same number throughout an equation or expression (e.g., $\Delta + \Delta = 8$; thus, $\Delta = 4$). Describe and use the commutative, associative, distributive, and identify properties of addition and multiplication, and the zero property of multiplication. 	<ul style="list-style-type: none"> Order of operations Express single-operation problem situations as equations and solve the equation. 	
<p>Standard III: Students will understand attributes and properties of plane geometric objects and spatial relationships.</p> <p>Objective 1: Identify and describe attributes of two-dimensional geometric shapes.</p> <ul style="list-style-type: none"> Name and describe lines that are parallel, <i>perpendicular</i>, and intersecting. Identify and describe right, acute, obtuse, and <i>straight</i> angles. Identify and describe figures that have line symmetry and <i>rotational symmetry</i>. 	<ul style="list-style-type: none"> Identify and describe the radius and diameter of a circle. <p>Extensions</p> <ul style="list-style-type: none"> Perpendicular lines Straight angles Rotational symmetry 	<ul style="list-style-type: none"> Identify and describe quadrilaterals. Compare two polygons to determine whether they are congruent or similar. Identify and describe cylinders and rectangular prisms.

Objective 2: Specify locations using grids and maps. <ul style="list-style-type: none"> Locate regions on a map of Utah. Give the regions of a position on a map of Utah. 	<ul style="list-style-type: none"> Locate coordinates in the first quadrant of a coordinate grid. Give the coordinates in the first quadrant of a coordinate grid. 	
Objective 3: Visualize and identify geometric shapes after applying transformations. <ul style="list-style-type: none"> Identify a translation, rotation, or a reflection of a geometric shape. 	<ul style="list-style-type: none"> Recognize that 90°, 180°, 270°, and 360° are associated, respectively, with $1/4$, $1/2$, $3/4$, and full turns. 	<ul style="list-style-type: none"> Relate cubes, cylinders, cones, and rectangular prisms to the two-dimensional shapes (nets) from which they were created.
Standard IV: Students will describe relationships among units of measure, use appropriate measurement tools, and use formulas to find area measurements. Objective 1: Describe relationships among units of measure for length, capacity, and weight, and determine measurements of angles using appropriate tools. <ul style="list-style-type: none"> Describe the relative size among metric units of length (i.e., millimeter, centimeter, meter), between metric units of capacity (i.e., milliliter, liter), and between metric units of weight (i.e., gram, kilogram). Describe the relative size among customary units of capacity (i.e., cup, pint, quart, gallon). Estimate and measure capacity using milliliters, liters, cups, pints, quarts, and gallons, and measure weight using grams and kilograms. 	<ul style="list-style-type: none"> Recognize that angles are measured in degrees and develop benchmark angles (e.g., 45°, 60°, 120°) using 90° angles to estimate angle measurement. Measure angles using a protractor or angle ruler. 	<ul style="list-style-type: none"> Identify a mile as a measure of distance and its relationship to other customary units of length. Measure the length of objects to the nearest centimeter, meter, quarter-inch, foot, and yard. Measure weight using pounds. Read, tell, and write time to the nearest minute, identifying a.m. and p.m. Determine the value of a combination of coins and bills that total \$20.00 or less. Count back change for a single-item purchase and determine the amount of change to be received from a multiple-item purchase.
IV.2. Recognize and describe area as a measurable attribute of two-dimensional shapes and calculate area measurements. <ul style="list-style-type: none"> Determine possible perimeters, in whole units, for a rectangle with a fixed area, and determine possible areas when given a rectangle with a fixed perimeter. 	<ul style="list-style-type: none"> Quantify area by finding the total number of same-sized units of area needed to fill the region without gaps or overlaps. Recognize that a square that is 1 unit on a side is the standard unit for measuring area. Develop the area formula for a rectangle and connect it with the area model for multiplication. Develop and use the area formula for a right triangle by comparing with the formula for a rectangle (e.g., two of the same triangles makes a rectangle). Develop, use, and justify the relationships among area formulas of triangles and parallelogram by decomposing and comparing with areas of right triangles and rectangles. 	

<p>Standard V: Students will interpret and organize collected data to make predictions, answer questions, and describe basic concepts of probability.</p> <p>Objective 1: Collect, organize, and display data to answer questions.</p> <ul style="list-style-type: none"> • Identify a question that can be answered by collecting data. • Collect, read, and interpret data from tables, graphs, charts, surveys, and observations. • Represent data using <i>frequency tables</i>, bar graphs, line plots, and <i>stem and leaf plots</i>. • Identify and distinguish between clusters and outliers of a data set. 	<p>Extensions:</p> <ul style="list-style-type: none"> • Use of frequency tables and stem and leaf plots. 	
<p>Objective 2: Describe and predict simple random outcomes.</p> <ul style="list-style-type: none"> • Describe the results of experiments involving random outcomes as simple ratios (e.g., 4 out of 9, 4/9). • Use the results of simple probability experiments, with and without replacement, to describe the likelihood of a specific outcome in the future. 	<ul style="list-style-type: none"> • Conduct simple probability experiments, with and without replacement, record possible outcomes systematically, and display results in an organized way. 	